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2007 Farm Bill Authorization Field Hearing Testimony

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Written Testimony
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My name is Joe Bezerra, Executive Director/Director of Operations of the California State University Agricultural Research Initiative (ARI) and the California Agricultural Technology Institute (CATI). Our offices are located at 2910 East Barstow Avenue in Fresno California on the California State University, Fresno campus.

Mr. Secretary, I commend and thank you and the California Department of Food and Agriculture (CDFA) for hosting field hearings in rural areas close to those who will be most dramatically and immediately affected by the writing and implementation of a new Farm Bill. This provides many more stakeholders an opportunity to impact the legislative process that will affect their livelihood and regional area economic development opportunities well into the future.

California State University, Fresno is a preeminent agricultural university within the nation's largest non-land grant university system, the 23 campus California State University System (CSU). Through the California Agricultural Technology Institute (CATI), it provides strategic leadership, administration, research information dissemination, and technology transfer oversight for the CSU's system wide applied agricultural and environmental research program, The California State University Agricultural Research Initiative (ARI). The ARI is an exemplary illustration of the CSU working for California through university-industry partnerships. It is a diverse and comprehensive multi-campus applied agricultural and environmental research program that annually leverages public funding with external resources on at least a one-to-one basis to fund research on high-priority issues challenging California agriculture, the environment, and consumer health and safety. It focuses the collective expertise of the CSU's four colleges of agriculture at California State University, Fresno; California Polytechnic State University, San Luis Obispo; California State Polytechnic University, Pomona; and California State University, Chico collaboratively with that of qualified faculty and research staff scientists from other universities and appropriate research organizations such as the USDA and national

laboratories on finding immediate and practical solutions for priority issues. Its research, education, outreach, and technology transfer activities augment, enhance and extend the basic research conducted by the nation's land grant universities. Its project and program results are made widely available in layman's terminology in the public domain, and technology transfer assistance and information dissemination are provided directly to the California producers, processors, and consumers who need it most. While most of its research activities are conducted within California, because of the diversity of California's more than 350 crop and livestock commodities, ARI's collaborative partnership approach to research, and the broad public dissemination of its results, ARI activities result in broad national agricultural benefit. ARI program benefits are transferable and extend well beyond farm gate receipts to include improvements in public health and safety, environmental conditions, regional economic development, and international competitiveness. The ARI is a program that will help guarantee the continued vitality of American agriculture many years into the future. Therefore, CSU and Fresno State through the ARI is uniquely qualified and positioned to be the nation's flagship applied research and higher education institution to lead a broad-based and diverse research effort that includes both traditional crop and livestock commodities and emerging specialty crop commodities.

While California agriculture's state economic significance is unquestioned, pressures beyond its control increasingly challenge its long-term sustainability and that of many of its producers. Urban encroachment, stringent state environmental standards, dwindling operating margins, fierce competition for the state's limited developed natural resources, low commodity prices, consumer misinformation, intense global competition, and stressed state and national budgets are only some of the uncertainties confronting the industry as a whole and individual producers specifically. Accessibility to state-of-the-art economic and scientifically-based production, processing, transportation, and marketing information, as well as technology transfer assistance, is increasingly of critical importance. As a result, small and large producers alike are in need of immediate assistance to find practical and affordable solutions, alternatives, and/or new technologies and management practices that will allow them to remain competitive. The 2007 Farm Bill must recognize and appropriately address the changing faces and challenges confronting the agricultural industry while ensuring and providing for an abundant, sustainable, and affordable quality national food supply. The Farm Bill should provide crucial strategic direction for the nation's agricultural industry in an increasingly global marketplace. Therefore, it is vital that the Bill recognize and address all responsible opportunities to maximize national competitiveness including applied research, outreach, education and technology transfer assistance. It is recommended that CDFA strongly support and encourage the Schwarzenegger administration to request inclusion of significant funding for applied agricultural and related environmental research. It is further recommended that CDFA specifically recommend and aggressively advocate for the inclusion of \$10 million annually in support of the California State University Agricultural Research Initiative. To this end, I offer you ARI and CATI assistance, where appropriate, and look forward to working with you, your staff, and industry leaders to ensure the success of this pivotal piece of legislation.

Attachment 1

Examples of Transferable Results in the Public Domain

ARI research results are available in the public domain, and generally applicable to improving agriculture and environmental practices throughout the United States and the world. For example:

- ***Air Freight*** – Worldwide demand for high quality food products that have been grown and/or processed under conditions that ensure the highest level of food safety is expected to rise. This ARI research examines the increasingly vital role that air freight services are likely to play in helping specialty crop growers and food processors respond to the opportunities as well as the challenges posed by a rapidly changing international market for fresh and processed food products. It is equally applicable to all U.S. specialty crop producers and processors.
- ***Workplace Safety*** – ARI is working to develop an internet storehouse of job safety information. When complete, the site will contain material and documents which can be downloaded by companies (including agribusinesses) to help write and implement their own injury and illness prevention plans.
- ***Viticulture*** – ARI researchers are working to identify factors contributing to wine spoilage. Results of this work have implications for viticulture not only in California, but in Virginia and other wine producing states throughout the country.
- ***Improved Satellite Imagery*** – Satellite imagery can be a useful tool for assessing crop health and problems in the field. Currently, it typically takes two to five weeks to process and deliver such data to the end user. ARI researchers are developing new tools to deliver improved imagery to the grower within 48 hours.
- ***Precision Agriculture*** – Precision agriculture, using Global Positioning System (GPS) technology, can revolutionize American agriculture, allowing for more efficient micro-applications of water, fertilizers, and pesticides. Still, many producers are uninformed about precision agriculture. ARI specialists are developing a free world wide web-based course to provide public access to precision agriculture information.
- ***Alternative Pesticides*** – Methyl Bromide is a soil fumigant used extensively for control of agricultural pests. While effective, this pesticide will soon be banned in the U.S. due to its harmful affects on the ozone layer. ARI research is developing less harmful alternatives which can be used throughout the United States.

- ***Dairy Gas Emissions*** – ARI researchers are developing new ways to better manage dairy gas emissions, to provide for a cleaner environment. While important to California, these techniques will be equally useful throughout the Northeast and Midwest.
- ***Cotton Growth*** – ARI researchers are doing extensive work in data analysis of precision farming to improve cotton production. While this work will help California agriculture, it is equally useful to producers in the Southern cotton growing states.
- ***Peach Production*** – ARI research is developing new rootstocks for reducing water and nutrient requirements during peach production. Improved peach production has positive implications for growers in the Southern states such as Georgia and South Carolina.
- ***Irrigation Research and Education*** – Demands on America's water supply are expected to increase even more during the coming century. ARI funding is being used to implement a five-phase research and education program to provide growers with direction and strategies for increasing water use efficiency. Such strategies are applicable throughout the U.S.

Attachment 2

California Agricultural Technology Institute (CATI) Overview

CATI is a non-profit, educational and research institution created in 1984 by a mandate of the California State Legislature to develop and evaluate new and promising technologies that could have the potential for improving the economic performance of California agriculture. Based at the California State University, Fresno, CATI operates under a permanent research mandate from the CSU and the California State Legislature. CATI and its research centers are nationally and internationally recognized as leaders in applied agricultural and natural resources research. Its administration is particularly noted for its collaborative university partnerships and its financial and information management capability. Its centers have a respected tradition of productive research efforts; highly effective educational outreach activities; and successful collaborative projects with industry, government, and educators. CATI resources include university faculty, staff, students, and consultants, in combination with extensive facilities at California State University, Fresno, located in the heart of California's Central Valley. In addition to the work being conducted by its own centers, CATI is leading a multi-campus cooperative enterprise of new research partnerships provided by the California State University Agricultural Research Initiative (ARI), which includes, but is not limited to, California State University, Fresno College of Agricultural Sciences and Technology; California Polytechnic State University, San Luis Obispo College of Agriculture; California State Polytechnic University, Pomona College of Agriculture; and California State University, Chico College of Agriculture. CATI provides administration, financial management and funded research oversight to ARI in the following research focus areas:

- Agricultural business
- Biodiversity
- Biotechnology
- Food safety, nutrition, processing, and product development
- Natural resources
- Production systems and cultural practices
- Public policy
- Water and irrigation technology

The CATI and ARI programs provide public funds that are matched with industry resources to fund high priority applied agricultural and natural resources research, development, and technology transfer activities, as well as related public and industry education and outreach. They focus the collective expertise of the California State University System's faculty and research staff on finding immediate and practical solutions for high priority challenges through a system of collaborative university-industry partnerships. Their research activities augment, enhance and extend basic research conducted by the nation's land grant universities, and improve the economic efficiency, profitability, and sustainability of California agriculture and its allied industries. Their program activities lead to consumer-sensitive and environmentally

sound food and agriculture systems and foster public confidence in food safety and agricultural research and production systems.

Agricultural Business

Historians will identify the current agricultural period as the second agricultural revolution. Mechanization, hybrid seeds, synthetic fertilizers and chemical pesticides highlighted the first revolution starting in the 19th century (1998 Agribusiness Management Conference, Alex Avery). Information management will drive 21st century agribusiness and agricultural production. Global positioning satellites and geographic information systems are now making possible “precision farming.” The Internet is making possible everything from services and supply purchasing to commodity trading and marketing. As technology continues to improve, we are likely to see more farmers managing their operations each day from their computer, rather than from a pickup truck. Investments in applied research, industry training and continuing education will be essential and significant to the state’s agricultural industry in the following areas:

- Precision Information Systems (GPS, GIS, high resolution imagery, etc.)
- On-farm Vertical Integration (dirt-to-plate)
- National and international marketing and market development
- Importing/exporting and export development
- Transportation systems (commodity and product distribution)
- Production economic analysis and modeling
- Post-governmental program agricultural production
- Personnel management and agricultural safety (especially in labor- intensive crops such as tree fruit, grapes, vegetables, etc.)
- Rural economic development
- Manager and supervisor training and continuing education

Biodiversity

California’s impressive biodiversity is most readily demonstrated by the number of native species found within its borders: 750 vertebrates, 6,800 plant species, and 25,000 insect species – more than any other state in the continental United States. Almost one-third of California’s plant and fish species and many of its natural communities are found nowhere else on earth (*Reassembling The Pieces*, 1992). California’s 20th century agricultural and explosive urban population growth, together with the state’s desire to preserve and restore natural communities, has inherently placed these competing interest groups in conflict. Applied research offers the best opportunity for development of a sustainable ecosystem. Applied research in the following areas is relevant to agricultural sustainability:

- Identifying management systems for shared multiple-use environments
- Developing technologies and techniques to preserve and restore natural communities in concert with agricultural and urban development
- Identifying ecological processes and habitat impact and response to human-induced changes

- Developing systems and guidelines for regional biodiversity planning

Biotechnology

The world's population will double by the year 2030, while its arable land will rapidly be depleted. California's expanding urban growth has consistently reduced available quality agricultural land and competes with food production for the state's limited developed natural resources. If California agriculture is to provide food and fiber for the state's burgeoning population, as well as for a positive agricultural export balance of trade, new technologies to develop more, better and cheaper foods and agricultural products are essential. Applied agricultural biotechnology is the new laboratory proving ground for advanced sustainable agricultural systems. Additionally, one of the CSU's greatest challenges is to facilitate the preparation of a well-trained technical and management workforce and continuing educational environment. Applied agricultural biotechnology research in the following areas is of significant relevance to the state's agricultural industry:

- Xenotransplants
- Bioactive animal products
- Textile development
- Plant and animal disease resistance, detection and control
- Plant and animal stress detection and control
- Herbicide tolerant crop and cropping systems
- Plant and animal insect resistance
- Plant and animal pesticide resistance

Food Safety, Nutrition, Processing, and Product Development

Agriculture's need to produce more, better and cheaper foods and agricultural products; the public's emphasis on convenience; and industry's increased awareness of safety issues are now driving the industry's product development, processing practices, and marketing strategies. Vertical integration will be the milestone of 21st century agriculture. According to the Food Marketing Institute, an average grocery store now contains more than 26,000 items, and more than 10,000 new products are needed each year to keep the shelves filled. Food safety and the "eating-on-the-go" convenience of meals and snacks have become hallmark concerns of the food shopper. Recent possible pathogen outbreaks and environmental abuses have caused consumers and regulatory agencies to scrutinize the "front end" of the production chain more closely (*Food Technology*, Elizabeth Sloan). Applied food product development, processing, packaging, and nutrition research is necessary to further advance industry development in the following areas:

- Foodborne pathogen identification and control
- Food safety technology and techniques
- New and/or improved food processing technologies
- Food packaging equipment and systems
- New product development testing
- Precooked/prepackaged product development

- Sensory evaluation testing
- Dietary food selection
- Dietary intake
- Nutrition education
- Nutrition-related health problems
- Continuing education and distance learning

Natural Resource Management

California's historical abundance of high quality natural resources has provided for its sustained population growth and agricultural development; however, preserving the delicate balance of biological resources appears to be the most problematic and vital aspect of managing its natural resources. California is unusually rich in minerals, timber, fertile soil and watershed. Its rich alluvial soils, especially in the Central Valley, and upland soils on mountain slopes provide some of the best farmland, forests, grazing land and watersheds in the western United States. Competition for and conservation of these and other renewable and nonrenewable natural resources, such as clean air and biological resources, has intensified with rapid state growth and development. Competing urban, agricultural and environmental interests have feuded for decades over ownership, allocation, and utilization of the state's natural resources. The CSU colleges of agriculture have a collective wealth of shared knowledge, experience and access to natural resources from which to build successful applied research projects and programs to investigate and develop conservation and restoration techniques and technologies, compatible multiple use systems, and environmental best management practices in the following areas:

- Air quality standards
- Agricultural PM10
- Flood control
- Chemical runoff (agricultural and urban)
- Soil erosion (water and wind)
- Water conservation (agricultural and urban)
- Waste recycling (agricultural and municipal)
- Wastewater treatment, reuse and disposal
- Watershed management
- Water storage facilities impact and management (on and off stream)
- Groundwater overdraft reduction and recharge
- Water quality standards (surface and groundwater)
- Water banking systems
- Drainage water utilization and disposal (agricultural and urban)
- Water marketing and transfers
- San Francisco Bay Delta restoration
- Desalination of agricultural drain water
- Around delta facility
- River and stream silting
- Land subsidence

- Land reclamation
- Biological resource restoration and management

Production Systems and Cultural Practices

With the arguable exception of financing, high quality and quantity output remains the backbone of any production agricultural system. Exponential advances in increasing both the above were achieved during the 20th century, due, in large part, to the development of hybrid seeds, synthetic fertilizers and chemical pesticides. While continued increases in quality and production are anticipated during the 21st century, they will most likely result from the application of precision information systems (GPS, GIS, etc.), biotechnology developments, new production systems, alternative crops, and improved electronic production monitoring and management practices. The CSU agricultural colleges are positioned to provide these new and expanded services in the following production areas:

- Alternative production systems
- Agricultural/environmental joint use systems
- Irrigation scheduling
- Sustainable production systems
- Cover crop selection and utilization
- Post harvest waste management
- Integrated pest management (IPM)
- Mechanization /automation
- Fertigation
- Chemigation
- Chemical utilization and reduction
- Composting and utilization
- Traditional pest management
- Drain water reuse
- Soils analysis and classing
- Landscape design and urban forestation
- Turf installation and management
- Irrigation system selection, installation, operation, and maintenance
- Canopy management
- Trellising systems
- Rootstock development and selection

Public Policy Development

California's future prosperity dictates that hard and extremely controversial policy choices about emerging technologies and utilization of the state's natural resources must be made. The CSU colleges of agriculture, together with their related applied research institutions, are well positioned to serve as non-partisan scientifically-based resources for policy makers. Choices regarding land use, water cost and allocation, air quality standards, environmental protection and restoration, and agricultural and municipal waste management will weigh heavily on agriculture's future profitability, competitiveness, and sustainability. In 1992

the Council on California Competitiveness identified agriculture, manufacturing, and biotechnology as three of the state's most critical industries. The Council concluded and recommended that in order to stimulate state economic development, California needed to support its key industries by investing in higher education, research, infrastructure, and advanced communication networks. It encouraged the state to invest in university research in those technologies, where applications for industry and manufacturing would be significant. It further encouraged the state to invest in research partnerships by establishing state match funding for research and development activities. Federal Specialty Crop State Block Grant funding will advance the Council's recommendations, build upon current CSU successful university-industry research investments, and provide match funding for high priority requests in the following areas:

- Land use strategic planning
- Preservation of prime agricultural land
- Non prime agricultural land utilization and natural resource management
- Water resources conservation, development, management and allocation
- Air quality improvement technologies and assessment
- Agricultural and human waste management technologies and systems
- Biotechnology protocols and utilization
- Natural resource management and restoration
- Biodiversity systems, technologies and management
- Food security information development and evaluation
- Agricultural communications, education and promotion

Water and Irrigation Technology

Demands upon California's water resources and its aging conveyance infrastructures will only increase as we approach the year 2020. California faces a continuing challenge to balance its finite water supplies against the needs of agriculture, the environment, and a growing population, and to make timely deliveries from watersheds to diversion points. In large part because of California's limited developed surface water supply and its extensively over drafted groundwater basins, agricultural and urban water districts and their users are required to implement water efficiency technologies and conservation practices. The CSU colleges of agriculture have been instrumental in the development, testing and evaluation of urban and agricultural irrigation equipment and systems for both public agencies and private businesses. Additionally, they have provided consumer and industry training courses, continuing education seminars, and Web-based urban and agricultural irrigation scheduling tutorials. Federal Specialty Crop State Block Grant funding will provide for new and expanded irrigation industry partnerships and facilitate applied research in the following, and other emerging, irrigation disciplines:

- Surface and groundwater management
- Bay-Delta water quality improvement
- Irrigation water management
- Drip/micro irrigation systems

- Sprinkler irrigation systems
- Frost protection systems
- Agricultural drainage reduction and on-farm recycling/ reuse systems
- Irrigation system evaluation
- Equipment testing and evaluation
- Training and continuing education
- Animal waste water management